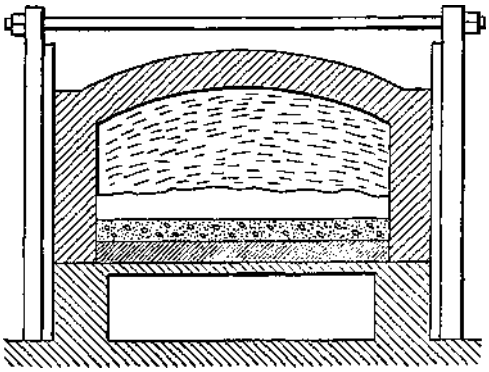
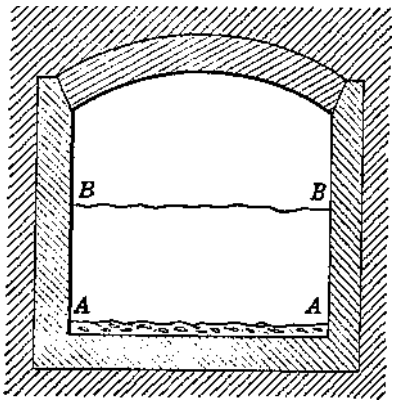
upon the sides (the walls of the furnace) (Fig. 7). The confining boundary upon the bottom may be present or not. In the same manner, a stream of water may be confined by walls below and upon both sides, while its upper surface is entirely free. In a similar way the gaseous stream has to be confined upon the top and the two sides, while upon the bottom its surface is entirely free.





It would reveal a serious error in this theory, if, for example, the breeching, or smoke flue, common to four boilers was found to be completely filled with gases without regard to the number of boilers which were in service. This, however, will not be the case. In a correctly proportioned smoke flue the free lower surface of the gaseous stream will be found in the neighborhood of the bottom *A A* (Fig. 8). If the volume of the gases flowing decreases to one-fourth its former volume,

the thickness of the stream decreases two and one-half times <[1]} or to 0.40 its former thickness, and the lower free surface of the gases will be found at the level *BB]* within the space *A ABB,* no circulation of the gases will be found. ([2])

[1] Where 2.5 = V4^ as may be seen further on, p. 40.

[2] This statement is not absolutely correct, as eddy currents will exist in the space *A ABB* due to the cooling effect of the walls upon the flowing stream of heated gases.